

Claims

- [c1] An apparatus for performing alignment and monitoring of optical sensors comprising:
- an invisible light source emitting an invisible light beam;
 - a visible light source emitting a visible light beam and positioned opposite from and approximately coaxial with said invisible light source;
 - an optical polarizing beam splitter having an outer reflecting surface and an inner reflecting surface, said outer reflecting surface reflecting approximately 100% of said invisible light beam and said inner reflecting surface reflecting approximately 50% of said visible light beam in the same path as said invisible light beam, said optical polarizing beam splitter positioned between and approximately coaxial with said invisible light source and said visible light source; and
 - an optical detector positioned opposite and approximately coaxial with said outer reflecting surface to collect both said reflected invisible and visible light beams.
- [c2] The apparatus of claim 1 wherein said optical polarizing beam splitter is rotatable.

- [c3] The apparatus of claim 2, further comprising:
a motor connected to said rotatable optical beam splitter
with a rotatable shaft, said rotatable shaft having a longitudinal opening concentric with its axis of rotation;
and
said visible light source positioned approximately coaxial
with said longitudinal opening.
- [c4] The apparatus of claim 1 wherein said visible light
source is a He-Ne laser.
- [c5] The apparatus of claim 1 wherein said invisible light
source is an infrared laser.
- [c6] The apparatus of claim 1 wherein said invisible light
source is an ultraviolet laser.
- [c7] An apparatus for performing alignment and monitoring
of optical sensors
comprising:
an invisible light source;
a visible light source;
a reflecting mirror;
means for alternatively shuttling said visible light source
and said invisible light source in optical alignment with
said reflecting mirror, and
an optical detector positioned opposite and approxi-

mately coaxial with said reflecting mirror.

- [c8] An apparatus for performing alignment and monitoring of optical sensors comprising:
- an invisible light source emitting an invisible light beam;
 - a visible light source emitting a visible light beam and positioned opposite and approximately coaxial to said invisible light source;
 - a dual mirror assembly positioned between and approximately coaxial with said visible light source and said invisible light source, said dual mirror assembly having a first side opposite said invisible light source and a second side opposite said visible light source such that in operation said invisible light beam and said visible light beam are both reflected and converge at a common point;
 - a reflecting mirror positioned in alignment with said common point such that both said invisible light beam and said visible light beam are reflected in the same direction; and
 - an optical detector positioned opposite and approximately coaxial with said reflecting mirror to collect said invisible light beam and said visible light beam.

- [c9] An apparatus for performing alignment and monitoring of optical sensors comprising:

a laser emitting diode having a visible light source and an invisible light source such that said laser emitting diode emits a visible light beam and an invisible light beam;

a reflecting mirror positioned opposite and approximately coaxial with said laser emitting diode; and

an optical detector positioned opposite and approximately coaxial with said reflecting mirror to collect said invisible light beam and said visible light beam.

[c10] The apparatus of claim 9 wherein said laser emitting diode is a dual element laser emitting diode which emits a visible laser beam and an invisible laser beam from the same component.

[c11] The apparatus of claim 9 wherein said light emitting diode is a dual light emitting diode comprising a visible laser source and an invisible laser source positioned adjacent to each other.

[c12] The apparatus of claim 9 wherein said light emitting diode is a coaxial light emitting diode comprising a visible laser source aligned directly in front of or behind an invisible laser source.

[c13] A method for performing alignment and monitoring of optical sensors comprising the steps of:

providing an invisible light source emitting an invisible light beam;
positioning a visible light source emitting a visible light beam opposite from and approximately coaxial with said invisible light source;
positioning an optical polarizing beam splitter between and approximately coaxial with said invisible light source and said visible light source, said optical polarizing beam splitter having an outer reflecting surface and an inner reflecting surface, said outer reflecting surface reflecting approximately 100% of said invisible light beam and said inner reflecting surface reflecting approximately 50% of said visible light beam in the same path as said invisible light beam; and
positioning an optical detector opposite and approximately coaxial with said outer reflecting surface to collect both said reflected invisible and visible light beams.

[c14] The method of claim 13 wherein said optical polarizing beam splitter is rotatable.

[c15] The method of claim 13 further comprising the steps of:
connecting a motor to said rotatable optical beam splitter with a rotatable shaft, said rotatable shaft having a longitudinal opening concentric with its axis of rotation;
and
positioning said visible light source approximately coax-

ial with said longitudinal opening.

[c16] The method of claim 13 wherein said visible light source is a He-Ne laser.

[c17] The method of claim 13 wherein said invisible light source is an infrared laser.

[c18] The method of claim 13 wherein said invisible light source is an ultraviolet laser.

[c19] A method for performing alignment and monitoring of optical sensors comprising the steps of:
providing an invisible light source, a visible light source and a reflecting mirror;
providing means for alternatively shutting said visible light source and said invisible light source in optical alignment with said reflecting mirror; and
positioning an optical detector opposite and approximately coaxial with said reflecting mirror.

[c20] A method for performing alignment and monitoring of optical sensors comprising the steps of:
providing an invisible light source emitting an invisible light beam;
positioning a visible light source emitting a visible light beam opposite and approximately coaxial to said invisible light source;

positioning a dual mirror assembly between and approximately coaxial with said visible light source and said invisible light source, said dual mirror assembly having a first side opposite said invisible light source and a second side opposite said visible light source such that in operation said invisible light beam and said visible light beam are both reflected and converge at a common point;

positioning a reflecting mirror in alignment with said common point such that both said invisible light beam and said visible light beam are reflected in the same direction; and

positioning an optical detector opposite and approximately coaxial with said reflecting mirror to collect said invisible light beam and said visible light beam.

- [c21] A method for performing alignment and monitoring of optical sensors comprising the steps of:
- providing a laser emitting diode having a visible light source and an invisible light source such that said laser emitting diode emits a visible light beam and an invisible light beam;
 - positioning a reflecting mirror opposite and approximately coaxial with said laser emitting diode; and
 - positioning an optical detector opposite and approximately coaxial with said reflecting mirror to collect said

invisible light beam and said visible light beam.

- [c22] The method of claim 21 wherein said laser emitting diode is a dual element laser emitting diode which emits a visible laser beam and an invisible laser beam from the same component.
- [c23] The method of claim 21 wherein said light emitting diode is a dual light emitting diode comprising a visible laser source and an invisible laser source positioned adjacent to each other.
- [c24] The method of claim 21 wherein said light emitting diode is a coaxial light emitting diode comprising a visible laser source aligned directly in front of or behind an invisible laser source.